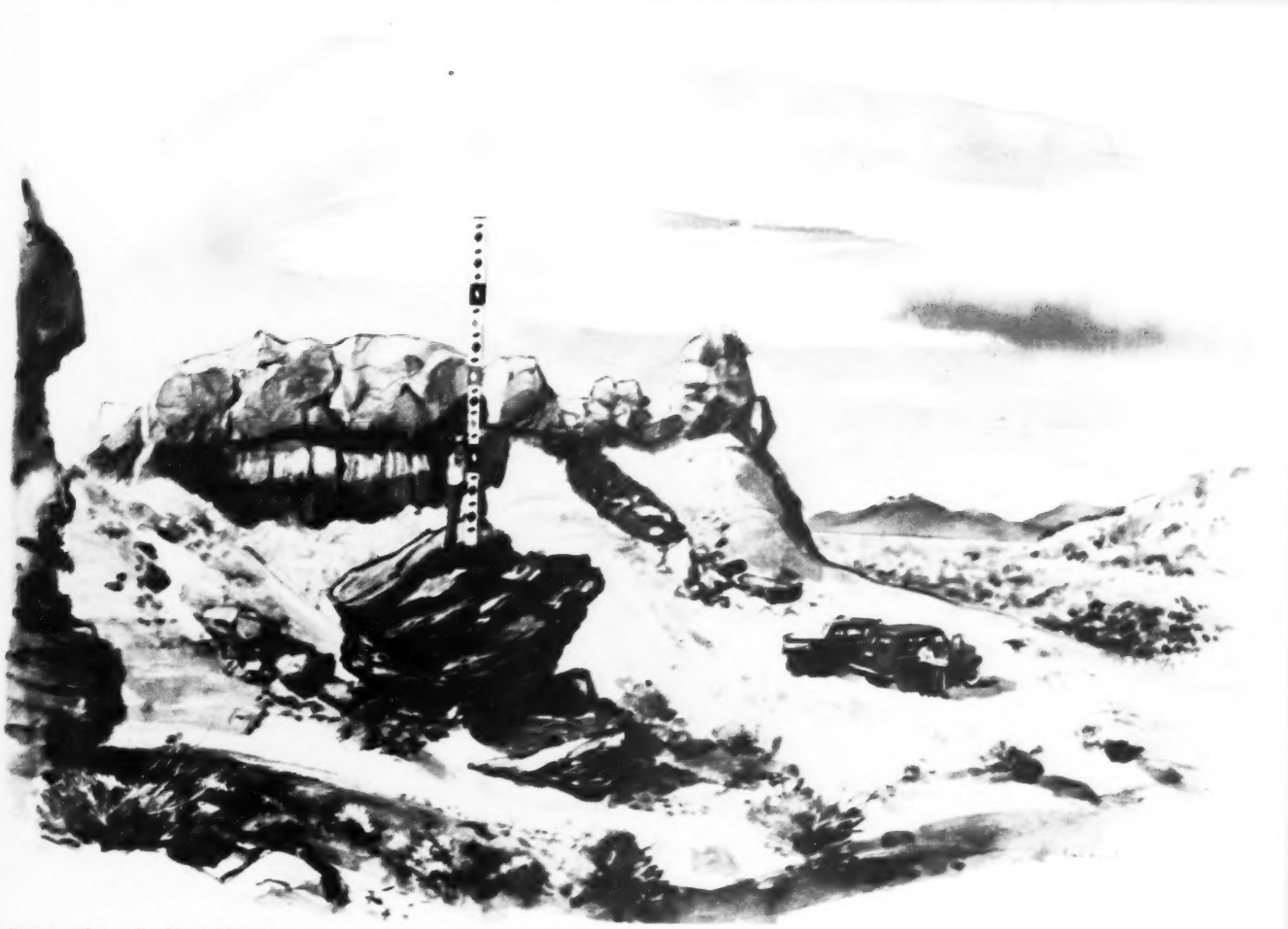
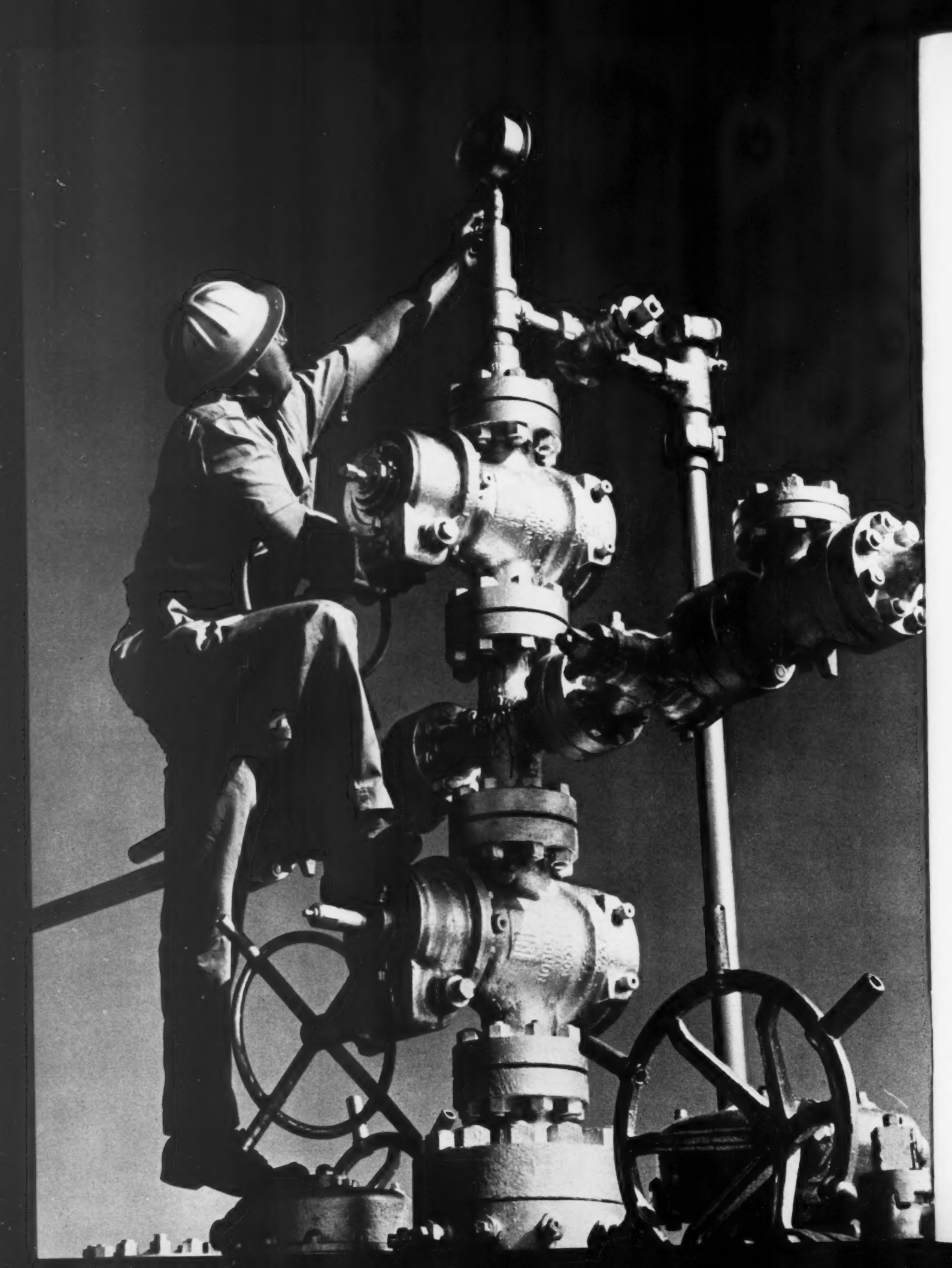


Survey Crew In New Mexico — *E. M. Schiwetz*

The HUMBLE WAY

MAY-JUNE, 1951



The HUMBLE WAY
MAY-JUNE, 1951
VOL. VII No. 1

Report on Annual Stockholders' Meeting

THE annual meeting of the stockholders of Humble Oil & Refining Company was held in Houston this year on May 14. L. T. Barrow, Chairman of the Board, presided. Hines H. Baker, President, commented on several outstanding points in 1950 operations and discussed recent developments for Humble and the petroleum industry. A summary of Mr. Baker's comments follows:

An important achievement in 1950 by the Company was the reduction in operating and maintenance expenses. These expenses were less than the year before for the Production and Refining Departments and for Humble Pipe Line Company, although the volume of business handled in these operations was greater than the year before.

Drilling costs were also reduced by means of good planning and improved technology, particularly the greater use of the jet-type drilling bit developed by Humble. The completion of fewer and less expensive wildcat wells was also a factor in reducing the average cost of well completions from the high level of 1949 back to an average of $82,600 a well, the same as in 1948.

Operations early in 1951 have continued to expand further following the substantial increase during 1950. Results for the first four months were much higher than during the same period a year ago and than the average for 1950. Comparing the first four months of 1951 with last year, Humble's crude oil production was up 17.7 per cent, refinery runs were 12.4 per cent higher, and trunk line deliveries were 26 per cent greater.

The outlook for 1951 indicates a level of operations for Humble comparable with results to date. Petroleum demand in the United States for the year is expected to be 8 to 10 per cent more than in 1950, and industry operations generally will be at record levels.

Humble plans a substantial increase in capital expenditures in 1951 over the $110,490,000 spent in 1950. The increase will be particularly in drilling. Ability to carry out the program will depend on steel supplies. The Company completed nearly 300 wells in the first four months of 1951.

Results of finding efforts during the first four months of 1951 have been encouraging. They are at a rate more favorable for both oil and gas than the average for the last two or three years.

Natural gas prices have been improving. On gas contracts negotiated since 1948, Humble has realized an average price of nearly 11 cents a thousand cubic feet, and a number of recent contracts to industries on the Gulf Coast have been at 15 cents. Gas is still cheap at this price relative to other fuels.

Humble is opposed to legislation seeking to fix minimum gas prices in Texas, because such legislation is contrary to the principles of a free market. The best interests of consumers and industry will be promoted by avoiding either minimum or maximum price controls.

Drilling on the continental shelf has been stopped by Humble and has virtually ceased for all operators, as a result of the Supreme Court decision of June 5, 1950, adverse to Louisiana and Texas. Current operations on the leases are being carried on under temporary permits issued by the Secretary of the Interior. Indications are that both the administration and Congress are agreed that leases heretofore issued by the States should be recognized, and it is believed that legislation accomplishing this result will be enacted.

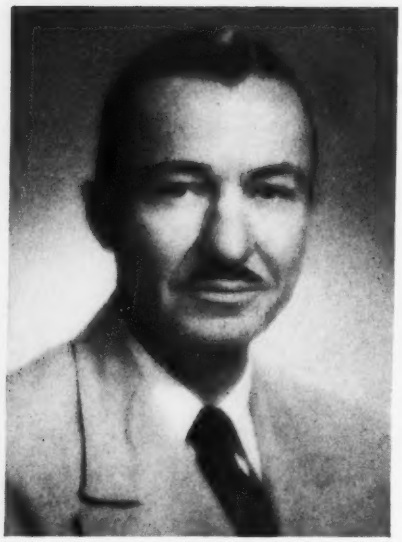
Treasury Department proposals to change tax provisions relating to depletion constitute a threat to the nation's oil supplies. A downward change in the tax provisions would reduce the incentive to search for new oil supplies and thereby curtail future production needed for economic progress and national security. The House Ways and Means Committee, which has heard testimony on this question by the Treasury Department and the petroleum industry, has shown a favorable understanding of the fairness of and necessity for continuing existing tax provisions applicable to oil and gas production, and has recommended against any change.

The growth in Humble's operations is indicated at the end of the 1950 Annual Report by the statistics for fifteen years from the prewar period 1936-1941 to the postwar period through 1950. These figures show the great expansion and present magnitude of the Company's business in physical volume and financial results. Operations have also become more complex.

Reaching high to the top of the glittering Christmas tree, a Humble employee checks pressure gauge on a gas injection well.

Rex G. Baker

H. W. Ferguson



Morgan J. Davis

A New Director and Three New Vice Presidents

FOLLOWING his review of the Company's business at the annual stockholders' meeting on May 14, President Hines H. Baker advised that the Board of Directors recommended the election of Richard J. Gonzalez, who has been the Company's economist since 1937, to fill a vacancy on the Board of Directors. Mr. Baker pointed out that there has been a need for a well trained economic analyst on the Board who can contribute to deliberations of the group a knowledge of general business and of broad factors involved in our economy. Economic analyses are increasingly important to the Company because of the influence of general business conditions on Humble's operations and the large amounts involved in the Company's investments.

Dr. Gonzalez received his Ph.D. in economics from the University of Texas in 1934. After a brief teaching career at the Universities of Texas and New Mexico, he joined Humble in 1937 as its economic advisor. He has had an active and important role in the work of industry committees, being Chairman of the Economics Advisory Committee of the Interstate Oil Compact Commission from 1946 through 1949, member of the Statistical Advisory Committee of the American Petroleum Institute, and of the Panel on Economic and Political Factors of the National Petroleum Council's Subcommittee on Long Term Domestic Oil and Gas Availability. In addition, he has served as a member of the Petroleum Advisory Committee to the Texas Legislative Council and has been active in local civic and cultural organizations.

Three new vice presidents, all with long and distinguished service records in the Company, were elected. They are Rex G. Baker, who has been a Director and General Counsel since 1943; H. W. Ferguson, a Director since 1945 in charge of Refining and Sales activities; and Morgan J. Davis, a Director since 1948 in charge of Exploration. Promotion of these three executives was made to put them in positions commensurate with their responsibilities. The great growth and present magnitude of Humble's operations impose a heavy responsibility on executives. With operations extending from Florida to California, Humble is the largest domestic oil producing company in the nation and ranks among the top companies in the industry in earnings and dividends.

Rex G. Baker received his B.A. and LL.B. degrees from the University of Texas in 1917 and joined Humble's Law Department in June, 1920. He was elected a Director and made General Counsel in 1943. In the course of his long service for Humble, Mr. Baker has dealt with every phase of the Company's legal problems.

H. W. Ferguson joined the Humble Company in 1924 after receiving a degree from the University of Michigan in chemical engineering. After a number of years of technical and engineering work in connection with the Company's refining operations, he was made Manager of Refining Operations in 1941. In 1945, he was elected to the Board and placed in charge of all refining operations. In 1947, the Company's sales operations were also brought under his leadership.

Morgan J. Davis, after receiving a degree in geology from the University of Texas in 1925, joined the Humble

Richard J. Gonzalez

Company in that year as a geologist in West Central Texas. After four years with Humble, Mr. Davis joined Nederlandsche Koloniale Petroleum Mij., with headquarters in Java, returning to Humble in 1934. After a series of promotions, he became Manager of Exploration in 1946, and in 1948 was made a member of the Company's Board of Directors, responsible for exploration.

Stock Option Plan

Stockholders approved an incentive stock option plan, of limited scope and modest cost, for executives. The primary purpose of the plan is to assist in retaining and developing good management in the years ahead.

The plan was adopted to deal with a real problem created by sharply graduated income tax rates which take a large part of the salary of top executives. Such graduated tax rates made it difficult for executives to derive much benefit from salary increases in keeping with performance and responsibility, especially during an inflationary period. In fact, the real earnings of top executives are lower now, considering inflation and taxes, than before World War II, although for most employees the purchasing power of wages and salaries after taxes has been improved or maintained by increases in the general scale of pay. It would require much higher salaries than Humble pays to provide its top executives with the same real income now as in 1939.

Large corporations generally have been faced with the problem of devising some method of compensation to hold outstanding executives in the face of opportunities elsewhere, particularly of going into business for themselves. Some corporations use large salary and bonus payments, but an increasing number have adopted stock option plans. In 1950 Congress specifically recognized stock option plans as a means of providing opportunity for executives to realize income through capital appreciation, thus encouraging executives to remain with a corporation and to secure a more direct interest in its success.

The plan provides that the Company may purchase up to 180,000 shares of its stock and grant options to purchase such stock during the next ten years at not less than 95 per cent of the market value at the time the options are granted. The maximum cost to the Company, based on the present market price of about $120 a share, would be $1,080,000 for the entire plan over the ten-year period. This cost would amount to 6 cents a share for the total shares outstanding. The maximum cost on account of any one executive would be $43,200 over the ten-year period of the plan.

Stockholders and Employees Thanked

In concluding his remarks, Mr. Baker thanked the stockholders for their continued support of management and spoke highly of the ability and loyalty of the personnel of the Humble Companies and the spirit of teamwork existing throughout the organization.

Directors and Officers Elected

Stockholders elected the following Directors:

Hines H. Baker	Rex G. Baker
L. T. Barrow	H. W. Ferguson
David Frame	Morgan J. Davis
D. B. Harris	C. E. Reistle, Jr.
J. A. Neath	Richard J. Gonzalez

Company Officers

Elected at the Directors' meeting immediately following the stockholders' meeting on May 14:

Hines H. Baker, President
L. T. Barrow, Chairman of the Board
David Frame, Vice President
D. B. Harris, Vice President and Treasurer
J. A. Neath, Vice President
Rex G. Baker, Vice President and General Counsel
H. W. Ferguson, Vice President
Morgan J. Davis, Vice President
Gay Carroll, Comptroller
H. K. Arnold, Secretary and Assistant Treasurer
Nelson Jones, General Attorney
J. R. Mulvey, Assistant Comptroller
Fladger F. Tannery, Assistant Comptroller
Paul Millsapps, Ass't Secretary and Ass't Treasurer
B. P. Barrett, Jr., Ass't Secretary and Ass't Treasurer
Mildred Bonnette, Assistant Secretary
Margaret W. Hatch, Assistant Secretary
Elizabeth H. Kenney, Assistant Secretary
Charles E. Kugler, Assistant Secretary
O. F. Carroll, Assistant Treasurer
I. D. Breedlove, Assistant Treasurer
R. C. Huder, Cashier
T. C. Brunson, Assistant Cashier
O. E. Roesler, Assistant Cashier
L. W. Groce, Assistant Cashier

What Makes America Great?

By Dr. R. J. Gonzalez*

THE average American today lives better than a king in 1851. He enjoys greater comfort and a wider variety of food, clothing, and shelter. He takes for granted marvelous systems of transportation, communication, and other things that could not be bought with any amount of money a century ago. Even compared with most people in the rest of the world today, he has far more comforts and material things of life.

What accounts for this remarkable achievement?

Three keys to economic progress have been used to bring about our high standard of living. CAPITAL, ENERGY, and FREEDOM are the secret to progress at all times and anywhere.

Productive capital is the first key to economic progress. In the form of machines, it is the magic multiplier of man's efforts to produce goods.

With such simple tools as an ax and a wheel, primitive man first began the upward climb along the path of progress. For many centuries man was limited to tools which he could operate by himself or with the use of animals. Then, within the past two hundred years, by applying mechanical power to productive machines, vast new possibilities were opened up. One new machine suggested others. Invention followed invention.

The development of mass production machines and techniques was a landmark in human progress. It resulted in production of such quantities and at such low cost that goods and comforts undreamed of before became available to the great mass of people.

Mass production requires an enormous amount of capital. In some industries the equipment required for the average worker costs more than $100,000, and for all manufacturing the cost of productive tools now approaches $10,000 per worker. How is an average worker to be provided with these tools which cost from three to thirty times as much as he can produce in a year? Unless means exist to encourage creation of this capital equipment, to replace it as it wears out, and to add new equipment constantly, our productive capacity will decline.

Capital has been created in the Western world by individuals rather than by government. It has been created under the incentive of the profit motive. The individual who wanted to improve his standard of living devoted part of his effort to creating productive equipment which would enable him to have more in the future. Families worked hard to give their children an opportunity to start out with a better education and more resources than their parents had. Without planning or central direction, these efforts led to the creation of more machines. As these machines increased production and raised standards of living, it became easier for people to spare part of current production to make more tools.

The widespread use of machines raises an important question: How should production be divided between those who provide capital equipment and those who run that equipment?

* *An address to the Dallas Chapter, Society for the Advancement of Management, May 9, 1951.*

The worker believes his contribution is the greater because machines could not produce without him. On the other hand, without the machines the worker could not produce enough to pay his wages. But since machines already exist,

cannot workers gain by appropriating for themselves all of the production made possible by the machines? The answer to this is an emphatic "No," even though it might appear that a gain could be made temporarily. *It is the continuous creation of new capital which brings about economic progress, not merely the use of the capital existing today.* Regardless of ownership, there must be enough incentive for someone to do without something today so that work may be applied to building new machines which will support future productive capacity. That incentive is the price paid for the use of capital in the form of interest and profits, for without that price future capital would not be forthcoming. Actually, the price paid to the creators of capital is a very small one, especially when we consider the additional production made possible by that capital.

For economic progress, we must have productive capital and the incentive to create more of it.

Mechanical Energy

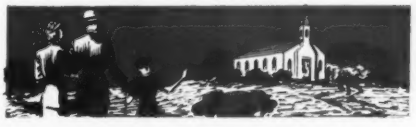
The productive machines of the modern world are not operated by human energy. They would stand idle but for the availability of enormous quantities of mechanical energy at low cost. Machines and energy together really turn out the goods of the world today. Our second key to economic progress is mechanical energy.

Mechanical energy is a modern Aladdin's Lamp. It literally performs miracles. It carries us through the air faster and more comfortably than any magic carpet. It transports people and goods all over the face of the world. It freezes and cooks our foods, cools us in summer, and warms us in winter. It powers the machines which make parts, and runs the assembly lines on which those parts are made into the millions of products we use. It drives our automobiles, lawn mowers, electric razors and hundreds of other gadgets from clocks to washing machines.

Our standard of living is peculiarly dependent upon mechanical power. The more machines we have, the more power we need to operate them. The more power and machines, the less work individuals have to do. Thus, we can enjoy today both a much higher standard of living than did our fathers and grandfathers in 1900 and more leisure. *This is truly the age of energy. We must have increasing supplies of such energy at reasonable cost if we are to continue our economic progress.*

Energy consumption at a high rate is especially characteristic of the United States. In this country we use ten times as much mechanical energy per capita as the people of the rest of the world. Motors with ten horsepower would be required per person, operating constantly every minute of the day and night, every day of the year, to equal the energy we use. It would take fifty servants for every man, woman, and child in the United States to produce that much energy! Even if we could hire and support that many servants, they would not be able to do some work that mechanical energy can do, such as lighting, heating, and cooling our homes and offices.

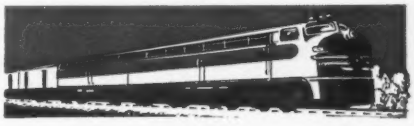
By what good fortune does the United States enjoy such an abundance of fuels to provide this mechanical energy? First, the fact that our country was well endowed with natural resources of coal, oil, and gas certainly has been important in our economic progress. But these resources were merely inert substances until man exercised initiative in discovering them and converting them to useful ends. Our enterprise has developed potential



resources more effectively in the United States than elsewhere in the world.

Our advantage in energy over the rest of the world has come particularly from a great development of oil and gas production under a system of competitive search. There has been found to date as much oil in the United States as in the rest of the world, and the United States has produced to date about two-thirds of all the oil produced in the world, although the potential resources here are much less than those in the rest of the world. The availability of liquid fuel in large quantities has been a major factor in the revolution brought about in American living by the widespread use of the automobile. We have become a nation on wheels dependent for the transportation of goods as well as ourselves to a large extent on the internal combustion engine, including the Diesel locomotive.

Many of us think of power largely in terms of electricity because that is so widely used in our homes and factories, but basically petroleum and coal really supply the power used in this country. Hydroelectric power actually accounts



for only about five per cent of the total energy used in the United States. Most of the electric power we use is generated from coal, oil, and gas. In recent years, oil and gas have come to supply much more energy than coal.

Can we continue to have enough energy or are we doomed to a falling standard of living when we exhaust our natural resources of mineral fuels? The prophets of gloom are convinced that we will run out of oil soon and all mineral energy eventually, with the result that our production based on machines will decrease. There is little basis for such fears so long as we encourage technological progress. Our entire experience demonstrates the enormous potentialities of new technology. We would have run out of oil long ago if we had depended merely on the technology available at the beginning of the twentieth century. It is the invention of new and better methods of searching for oil, of drilling, and of producing oil which has supplied us with such vast quantities of liquid fuels at low cost. Similarly, the pressure of competition from oil has led to improvements in use of coal and better machinery for mining coal. *Our technology is not static. On the contrary, it is highly dynamic, always improving. Under the spur of competition, it is bound to advance still further. In that case, we can count on improvements in technology to provide the mechanical energy we need for an expanding economy.*

The known resources, proved and potential, of oil, gas, and coal are suf-

ficient to last for a very long time into the future. How many years such supplies will last cannot be predicted with certainty. It is reasonable to say, however, that these supplies will last long enough for technology to open up new sources of power and energy. Power from the rays of the sun, or from nuclear fission, may ultimately supplant power from coal and oil and gas as the prime mover in our productive effort.

Human Freedom

Productive machines and mechanical energy are the prime movers in economic progress, but their effective development depends upon a proper climate of ideas. Ideas are ultimately man's distinguishing characteristic and most powerful force. Of man's ideas, human freedom stands out as the third key to economic progress.

The traditional, customary relations of people in the Middle Ages were a chain to the past and a barrier to progress. So long as an individual's occupation and status in life depended on his birth, regardless of ability, there was little opportunity or incentive for improvement. Only when such traditional bonds were broken by the concept of individual equality and freedom did society begin to advance rapidly.

Modern concepts of a free society were formulated less than two hundred years ago. Economically, they were expressed by Adam Smith in his famous "Inquiry into the Nature and Causes

of the Wealth of Nations" published in 1776. Politically, their clearest expression was in the Declaration of Independence of the same year. The founders of this country held these truths to be self-evident: "That all men are created equal; that they are endowed by their Creator with certain inalienable rights; that among these are life, liberty, and the pursuit of happiness." The history of the United States represents the logical development of this simple, fundamental thesis.

There is great significance in the use of the phrase, "the pursuit of happiness," in the Declaration of Independence. Happiness itself was not listed as an inalienable right. *Instead, our right is to work and search for happiness.* In that pursuit, our predecessors conquered a continent and built a nation.

Because individuals are free to enjoy the results of their effort, they have been encouraged to increase production and to create capital equipment.

In the pursuit of happiness they have added enormously to the prosperity of the entire population. Some few have made fortunes as a result of their inventions and enterprise, but the principal benefits have been for all of us in the form of automobiles, plumbing, central heating, electricity, and countless conveniences unknown in 1850. Thus, freedom has contributed to prosperity and happiness for all.

Freedom is the crucial issue in the world today. Every economic system must use productive capital and mechanical energy if it is to be successful, so the basic distinction between systems is whether they accept or reject freedom as a principle for organizing human activity. The only alternative to free choice is compulsory force. In our system, the individual decides what he wants to do or buy and the government helps maintain the greatest freedom for all of us. The alternative is for government to force people to do what it wishes. One system takes advantage of all the ideas developed by a free people in a competitive society under the stimulus of private enterprise; the other subjects everyone to the ideas of a few men in charge of planning.

Man's future advance depends upon capital, energy, and freedom. *But only education can teach the world to know and use the keys to economic progress.* Education throughout the world, as well as in this country, is needed to create an understanding of these factors in raising standards of living.

Education has been a catalyst in economic progress. Education has taught us to understand and use productive capital, mechanical energy, and freedom. In schools and through experience we have learned how to build and operate machines, how to develop energy resources, and how to organize human activity to best advantage. We have learned not merely to apply what we are taught, but to develop new ideas, machines, and processes.

Education has also contributed profoundly to equality of opportunity. Such equality is essentially that contemplated in the Declaration of Independence, for the differences between individuals are too great to believe that the phrase "all men are created equal" was intended to mean that all men are equal in a literal sense. Opportunity to progress as far as ability and effort permit has inspired the people of this country to self-improvement on a remarkable scale. It has led to a rapid economic advance that allows each new generation to start at a higher level than the one before.

In science and material progress we have used education to great advantage, but in helping us to find happiness, we have not used it quite so well. Education increases our knowledge and wants so much that sometimes we are more inclined to look at the things we want but do not have than at all the goods we do enjoy. By such strange reasoning we can make ourselves unhappy even in the midst of great economic prosperity. Even the keys to economic progress will fail to make us happy unless we learn that there are other values in life beyond material goods.

Our economic system cannot be transplanted successfully in its material aspects alone. If it is to thrive elsewhere, freedom and education must go with it. Machines and energy are the material resources basic to production, but it takes free men of intelligence, education, and good will to create from these resources a dynamic economy capable of further progress. Therein lies one of the greatest problems in improving economic conditions abroad, for it is not enough merely to provide other people with machines and fuels. With those commodities must go the principles of a free society. For millions of people of this world who have never known real freedom, it will not be easy to grasp or apply the essentials of economic progress. Still, we must strive to help them understand what it takes to improve their lot, for if we fail they may pull us down along with them.

U. S. Economy—1951 Model

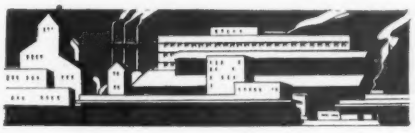
The standard of living delivered by our economy in 1951 is as far superior to that of 1900 as is the automobile of today to the first gasoline buggy. In terms of output, quality, and price the achievements of the twentieth century are convincing proof of the efficiency

of a free economy. Why, then, should there be any debate over the best system for achieving economic progress? Why should anyone seek to change our 1951 model of the free economy?

Characteristically, Americans seek better things, no matter how good the "current model" may be. We are not satisfied that this year's automobiles are better than those preceding them, but instead look forward with impatience for next year's models which will be better. The same attitude prevails with respect to our economy: We know it is good, but we would like to make it still better.

Only a free economy can achieve economic progress without coercion and central direction. The capital and energy which make the United States prosperous have been created by individual initiative and private enterprise, not by government action. A democratic government cannot be a successful creator of productive capital because the majority of the voters prefer to have tax money spent for present benefits rather than for projects productive only in the future. For a government to be a major factor in building capital equipment, it must be a dictatorship indifferent to the wishes of the people, but then there are lost the individual initiative and private enterprise most effective in developing the productive capacities of people. A free economy provides the greatest development of machines and fuels and no other system can remotely approach it.

In the process of improving our economic system, many changes have been made from the free economy visualized in classical economic theory. Some of these changes have involved government regulation of economic activity, largely in the form of definition of the rules of fair play. Some controls of this kind can contribute to the effective functioning of an economy without destroying its fundamental principle, but that does not mean that an indefinite extension of economic regulation or planning by government would be good. Beyond a certain point government action hinders rather than helps production. There is a vast difference between maintaining freedom and competition and smothering them in excess regulation. Laws which go beyond the principles of a free economy into the field of government direction or operation of business destroy freedom and decrease production.



Business leaders of the United States have devoted their energies so fully to creating a technically productive system that they have not always given enough attention to the human aspects which must be taken into account if the system is actually to operate efficiently. Experience proves, however, that social maladjustments can act as limiting factors on technical progress. Therefore, business men must evaluate anew their role in production as involving social as well as economic aspects. Then they will again have a positive program for progress to offer. Business men must provide such a program if they are to receive popular support; for leadership must be positive and can never be merely negative.

Let us plan to improve the 1951 model of the free economy, but let us not make the fatal mistake of forgetting the fundamental forces of that system as we design the new model.

Toward A Better World

The marvelous economic progress of the Western World has been built upon productive capital, mechanical energy, and human freedom with the assistance of education. The system has been so successful that it has aroused the envy of the rest of the world. Millions of people on the edge of starvation in other countries are eager to improve their life and to attain even part of what we have. They would like overnight to achieve more than they have in two thousand years, and as much as the United States has accomplished in a century of amazing progress. Since they do not understand how we have reached our present position, it is not strange that they fall victim to Communist doctrines which offer them the promise of sharing all that we have created. For most of these people, these empty promises outweigh fears of dictatorship, for few of them have known freedom such as we enjoy. *The tragic error is that we have not made the rest of the world see that freedom promotes economic progress, in addition to being a priceless right in itself.*

It is the task of Western civilization to demonstrate to the rest of the world that the road to economic progress is not one of dividing existing wealth, but rather of creating more new wealth by the processes of a free economy. Our great asset is our ability to produce more and better goods, not our present possessions. We have a responsibility to help the rest of the world improve its standards of living by means of an understanding of the basic forces of a productive economy. If we can make clear that machines, energy, and freedom are the indispensable ingredients necessary for economic progress, then we will have done all we can to lead the world along the road to future prosperity and peace.

The world is confronted with a choice between rival economic systems. The appeal of our rival is necessarily emotional, for its system has not proved as productive as ours. Emotion frequently is more appealing than logic, but it does not solve practical economic problems. Our superb economic system offers the practical advantage of superior production, which is of primary concern to the rest of the world. As a bonus of the greatest value it also provides freedom. Surely, any good American salesman should be able to sell such a system on practical or emotional grounds. Perhaps our trouble is that we have been too busy improving our system at home to bother about exporting it to foreign markets! It is essential, however, that we concern ourselves with the relation between the progress of the rest of the world and our own, for failure to do so may destroy us. A positive role of leadership on our part must surely convince other people that they too can enjoy economic progress and freedom together.

If we have the understanding and courage to use the keys to economic progress which have brought us so far and so fast in man's upward climb, we can—and will—build a better world than we can dream of today.

The fish they caught brings smiles to the crew. It is a broken logging line that had to be fished up, piece by piece, from below.

The lure they used to catch the fish is a spear. Barbs arranged along the side snag onto lost objects and lift them to the surface.

FISHING IS NO FUN

Oilfield Angling Calls for Patience, Skill, and a Strange Assortment of Lures

WHEN a driller's log carries the single entry — "Fishing" — it doesn't mean that the crew has developed spring fever and decided to take a holiday. They're doing an entirely different kind of fishing; a most expensive kind that is neither a sport nor a pleasure.

In oilfield language, anything that gets stuck or lost in the hole while a well is being drilled is called a "fish." And any roughneck knows there are as many different kinds of fish around a drilling rig as there are in the sea!

Drill pipe and drill collars sometimes break or twist off. Holes cave in, wedging pipe in a vise-like grip. Parts of drilling bits shear off and stay at the bottom. Core barrels and logging instruments are pulled off their lines like fishhooks left in a sunken log. A drilling crew can never be sure of *anything* that goes in the hole. It may come out or it may not.

On the drilling floor, a hole left open during "round trips" seems to have an almost magnetic attraction for anything that rolls or drops. A drilling bit, after being unscrewed, sometimes starts to roll. Quickly, before anyone can catch it, it approaches the hole, wavers at the brink, and plunks to a stop two miles below. A sledgehammer spurts from a roughneck's grasp and ends up in the bottom of the hole. Nearly three miles of logging line snaps apart and curls up on the bottom like so much spaghetti. Even lunch boxes, safety hats, and other objects in number too discouraging to mention have taken the long plunge and become fish. Some of these objects present no serious problem; they are soft enough to break up by drilling.

If there is a fish that cannot be removed by drilling, the crew has a real job on its hands. There's not much they can do except try to get the fish out; or "sidetrack" (drill around the fish); or plug and abandon the hole. Those last two choices are usually last-resort measures. In most cases, the crew goes fishing, or calls in an expert to do it for them.

No real fisherman goes blindly into strange waters and hopes for a good catch. Neither does an oilfield angler start to work without knowing something about his fish. *What* is it? *Where* is it? *How* did it get there? Once he has the answer to these questions, he is ready to bait his line.

Some fish of the finny kind are harder to catch than others. Not all of them will rise to the same lure. And that goes double for oilfield fish. Like

any real angler, the oilfield fisherman carries several kinds of bait in his box and chooses each one with loving care for the job it will do best. He uses *overshots* (fit over the fish and trap it snugly), *junk baskets* (scoop up small fish), *taps* (fit into the fish), *jars* (to pound and loosen the fish), *spears* (snag onto and hold the fish), *alligator grabs* (pincers that snap together and grasp the fish), *mills* (grind up the fish), *busters* (break up the fish), and scores of others. The bait an expert uses depends on the type of fish, how it is trapped, and where it lies.

If a crew is lucky, it may take only a few hours' work with a simple tool to catch a fish. But sometimes it will run into days, or even weeks, of tedious and costly work. At first, most drilling crews may try to catch their own fish. But if it looks like a long and difficult job, a specialist is usually sent for. Nothing calls for more experience and skill than the difficult "deep sea" type of oilfield fishing. It is here that an expert really earns his pay. Where a novice would grope blindly, an expert knows by the "feel of his line" and by other signs whether he is near to his catch.

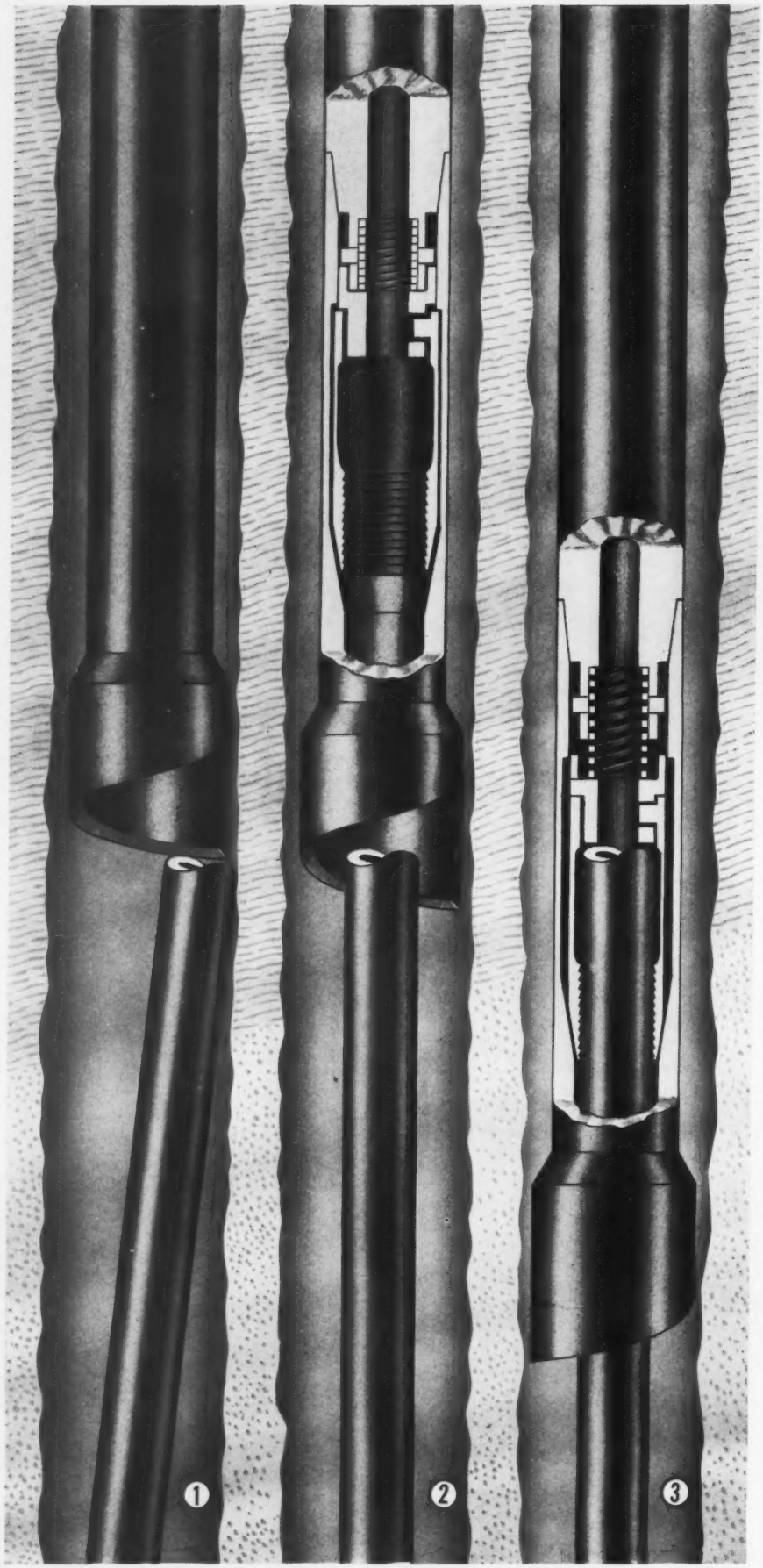
Equipment failures, such as drill pipe and drill collars twisting off, account for most of Humble's fishing jobs. Most of these are eventually recovered with an overshot, which fits over the fish, jams down on it tightly, clasps it, and lifts it to the surface.

Where pipe doesn't break, but sticks in the hole, the job of freeing and recovering it may be big and bad. In the worst cases, a combination of many tools and techniques may be necessary to bring up the fish. If the pipe won't work free under normal coaxing, the fisherman may try to "spot" oil or acid around it to loosen it. If this fails, he may try to unscrew the pipe as near the stuck joint as possible. He may even have to blast the threads loose with a charge of explosive, just as a sharp blow loosens a balky lid on a fruit-jar. Sometimes it may be necessary to run a special set of knives down into or over the pipe and cut the pipe in two.

Fishing tools at left give an idea of the great variety used. On the ground are a short *mill* (for grinding objects), a *junk basket* (for scooping them up), and a *spear* (for seizing and lifting). Being loaded is a large *taper tap*, so made that it will fit into and engage a fish somewhere along its length. At right, an *overshot* is in use.

Sharp-toothed *washover shoes* (above). These are actually hollow bits that drill away whatever is holding the fish. When the imprisoning material has been washed away by mud or water, the fish can be brought up with a *taper tap*, *overshot*, or other tool.

A most unusual fish at right; a flat, round piece of metal that somehow fell into the hole. When the crew tried to drill through it, the bit made an impression of its teeth in the fish. The specimen was finally recovered with a *junk basket*.



Operations are then begun to wash out caved-in material holding the pipe before recovering the fish with an overshot or some other tool.

Small objects lost in the hole usually don't cause as much trouble and lost time as pipe that sticks or twists off, but they can be hard to handle. In one case, the wire line on a logging instrument was lost in more than 12,000 feet of hole on an offshore rig. It was recovered by a spear, piece by piece, after 79 trips! Other tools used to bring up or dispose of the pesky trash are junk baskets, mills, grabs, and busters.

There is, of course, a certain amount of satisfaction for the fisherman in a job that ends well. But a look at the price tag is apt to take all the joy out of it for the person or company drilling the well. Not only must the fisherman be paid; productive drilling is at a standstill while the fish is being caught. From 40 to 50 dollars an hour is a high price to pay for something that doesn't make the hole deeper—and that's about the average drilling costs these days for a heavy rig. Daily rig costs go right on, no matter whether the crew is drilling or fishing.

Fishing, like dry holes and taxes, will always be a part of the oil business. But ways and means are being found to make fishing jobs shorter and less expensive. New fishing tools, new electronic devices for locating fish, new techniques, and greater experience fight on the side of the driller. Just the same, plenty of blue chips are bet on every hand that holds a fishing line. Those drilling the wells are willing to spend money and take risks before they decide to quit and try somewhere else.

It's a good thing for all of us that the oil industry is like that.

Overshot method of recovering fish from hole is illustrated in this three-step cutaway drawing:

(1) Fishing tool is lowered in hole until fish is contacted.

(2) Overshot is then slowly revolved in clockwise direction to pick up and center fish. Slips in overshot are in open position—held by locking lug.

(3) Overshot is lowered over fish until fish bumps latch. Half turn in counter-clockwise direction then releases slip-locking latch. Spring forces slips down against shoulder into set position. Fish is now caught and is pulled from hole.

Ship Rock in northwestern New Mexico stands guard while gravity meter operator takes reading and associate makes notes.

IN MOUNTAINS AND MARSHES

Gravity Meter Crews Are Industry's Advance Guard in the Search for Oil

TO help explore the millions of acres of the earth's surface under which oil or gas may be found, oil scientists some 20 years ago developed an instrument which makes it possible to take a quick look at large areas at a reasonable cost. This reconnaissance device is the gravity meter.

The instrument makes use of the Universal Law of Gravitation as first enunciated by Sir Isaac Newton—that a force of attraction exists between any two bodies, which increases with the size and density of those bodies and decreases with the lengthening of the distance between them. Fortunately, differences in density of beds in underground formations exist and are such that the force of attraction on a body at the surface will vary from point to point.

Oil and gas are found in underground traps of various kinds—anticlines, domes, lenses, faults. Because these irregularities occur in different shapes and in different make-up of the beds forming them, the possibility of finding them by gravity measurements suggested itself to physicists at the turn of the century.

Permit men contact landowners to gain permission for the gravity crew to operate. Humble permit man checks over map with friendly Navajo Indian in front of his adobe hogan.

In the trackless, mountainous wastelands crews consult map to make certain their work continues according to plan.

They knew of three ways to measure the gravity field; the force of attraction on a body at the surface: the pendulum, the torsion balance, and the gravity meter. The first two are involved, cumbersome, and expensive in operation. However, the torsion balance method was used extensively by the oil industry for some years. It was in the early 30's, with Humble scientists taking a leading part, that the industry developed practical gravity meters now used all over the world.

Today's typical gravity meter is in principle a simple device. It is housed in a metallic cylinder mounted on a tripod. Inside a mass of metal is suspended by a spring. Connected to the spring are gauges which record its action and magnify the minute variations in its length as the force of gravity exerts itself. Dense and shallow beds, such as

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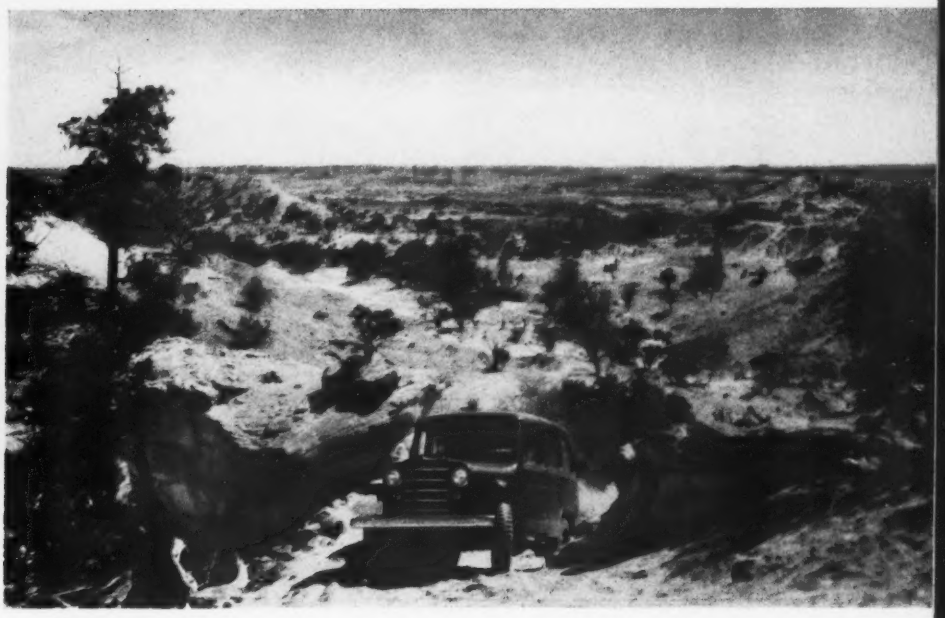
Seated in the station wagon, gravity meter operator levels instrument on the tripod legs extending down through vehicle's floor and takes a reading without removing the instrument.

Party members pause to get their bearings before starting into the rough country.



Lightly used New Mexico trails make slow driving for Humble gravity meter crew.

granite near the surface exert a strong pull; beds of lesser density and greater depths such as a deep salt dome, exert less pull. Differences in "pull" at locations over a large area can be interpreted in terms of underground formations.

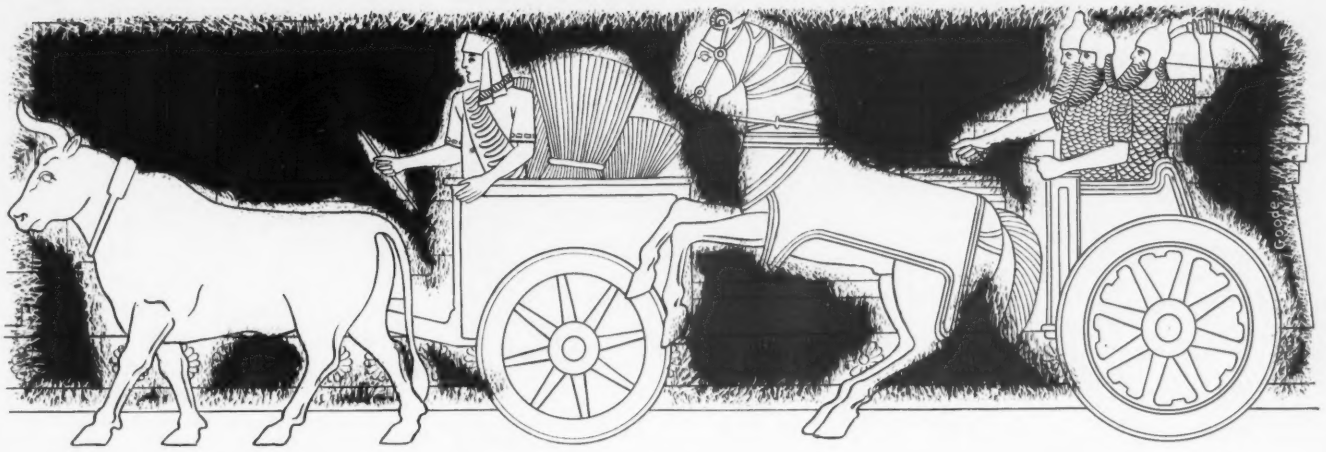
Because it is a compact instrument, the gravity meter requires little space and offers almost no transportation problems. One man can operate it, and it can be taken to isolated areas—limited only by man's ability to get there with it. In mountainous country it may be carried by small vehicle, or even by pack mule; into the trackless marshes it may be flown by helicopter.

The information gained by reading the gravity meter at any given location must be accompanied by accurate surveying of location and elevation. Because the earth is neither a flat plane, nor a perfect sphere, latitude and such surface features as hills and valleys have to be taken into account to make sure that the reading expresses only effects due to underground conditions.

A gravity crew consists of four to six men, including surveyors, and two to three vehicles. By contrast, a seismic crew is made up of some 25 men driving from eight to 10 cars and trucks. And whereas the seismic crew can shoot an average of 20 holes per day on a few hundred acres, a gravity crew will make 60 locations a day, covering thousands of acres. Thus the economy of the gravity meter method.

Final interpretations of the data into useful geologic information is an involved, highly technical job. At best the picture gained of underground formations is not as clear as that provided by more expensive and slower seismic operations. But, because the gravity meter offers a relatively inexpensive way of giving a large area a preliminary "once over" it has proven itself the oil industry's best reconnaissance tool.

Grass matted marshlands of southern Louisiana make travel with any kind of land vehicle extremely slow. In this area the gravity meter and operator are flown by helicopter. As soon as the ship lands the Humble operator sets the gravity meter on the tripod extending through the cabin floor (below). As he makes ready to take a reading the pilot holds the giant rotor to eliminate minor vibrations which would affect the delicate instrument. To land, take reading, and leave takes eight minutes.



ASPHALT GROWS UP

Oil Industry Now Supplies Vast Quantities for Many Modern Uses

NEBUCHADNEZZAR, King of Babylon, was a road-builder 2000 years ahead of his time. As early as 600 B.C., chariots in his wicked but structurally magnificent city rumbled over streets built of bricks bonded together with *asphalt!* In that day, the supply is said to have come from deposits which bubbled to the surface of the Dead Sea. Before its value as a road material was discovered, the ancient Egyptians had used asphalt in preparing mummies.

For some reason, asphalt as a road-building material did not find favor with the less engineering-minded line of kings that followed Nebuchadnezzar. Even the Romans, noted for their stone roads that stretched as far as England, did not use asphalt. When it finally made a comeback in Europe, it did so almost by accident.

A Road Built by Accident

In the middle 19th Century, rock asphalt was being mined in Europe only for the oil it contained. Two-wheeled carts carried loads of the raw material from mine to kettle, where oil was boiled off. Then, as the work went on, some bright chap had an idea. He noticed that fragments of rock asphalt fell off the carts en route to the kettles, gradually forming a smooth, durable, waterproof surface. Along this highway built by accident the carts rolled smoothly and rapidly in all kinds of weather.

The man with the inventive mind lost no time in putting his idea to work. Paris, Brussels, and other European capitals began to dig up some of their rough cobblestone streets and replace them with smooth ribbons of asphalt.

Asphalt Streets for America

Word soon reached the United States that fashionable carriages in the capitals of Europe had found a new and better surface to ride on. Luckily, there was a ready-made source of supply for this country. Rock asphalt had for years served as ballast in grain ships returning empty from Europe to the United States. We lost no time in putting asphalt to work over here. The first road was built with rock asphalt in Newark, New Jersey, in 1870.

At first, asphalt roads were more or less curiosities confined to private driveways and the elegant boulevards of larger cities. There was yet no real need nor demand for them on a national scale. But the invention of the automobile changed all that.

Cars today glide quickly and smoothly over ribbons of all-weather asphalt roads.

Miles by the Millions

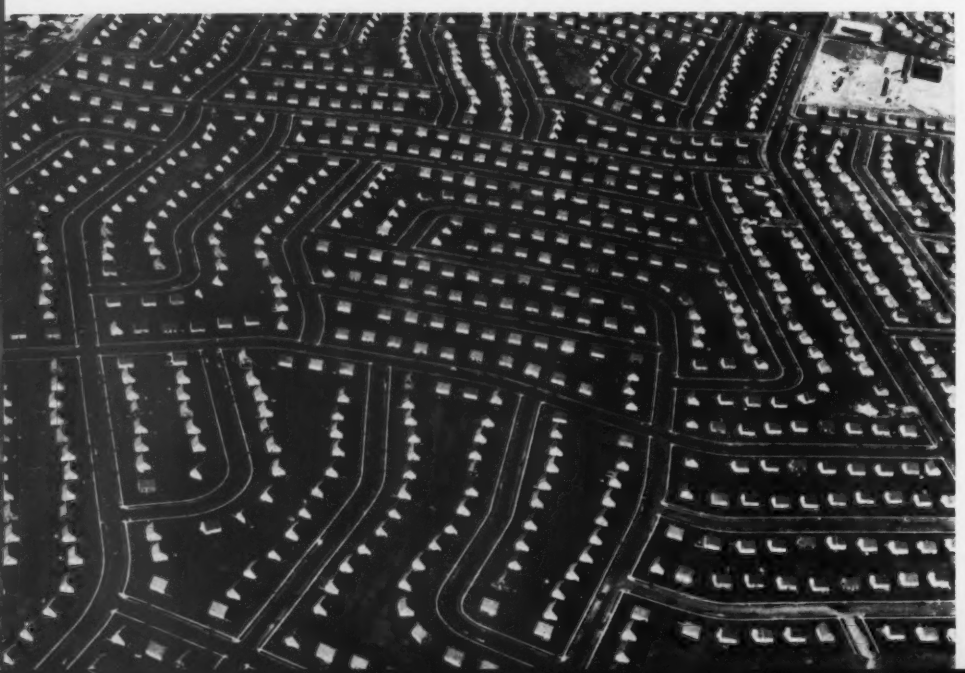
As production of automobiles increased and their use became widespread, there came a skyrocketing demand for paved roads. America could not possibly get all the roads it needed. There simply wasn't enough asphalt in the natural "lakes" on Trinidad, nor in all the rock asphalt of Europe, to supply the demand. Contractors turned to the source which now supplies practically all the asphalt used in this country—the American oil industry.

As it has always done, the oil industry delivered the goods. Today, the U. S. is honeycombed and criss-crossed with nearly two million miles of roads, most of them paved with asphalt. And asphalt takes a terrible beating. If the 50 million vehicles now registered in the U. S. drove an average of only 1000 miles a year each, our roads would have to support a total of *50 billion miles a year.*

There's little rest for roads at that rate! Last year, 65,700,000 barrels of asphalt poured from American oil refineries to repair old roads and build new ones. It was the biggest year in

Undersealing a concrete road with asphalt. Moisture, seeping up under concrete sections, causes them to break or settle. Asphalt forms a firm, waterproof under-layer.

Asphalt to line canals and prevent seepage is fast becoming an important means of saving the nation's water supplies, especially in the Western States. Larger canals require special machinery to place the asphalt. Below, in an intriguing pattern, lie homes of the famous Levittown development on Long Island. Streets are asphalt.



asphalt's history, twice as much as the nation used in 1940.

Road Building

Engineering aspects of building roads are no concern of this article. It is enough to say that any number of methods and mixtures are used, ranging from elaborate, multi-layer roads to those with a single mixture for a wearing surface. It is sometimes possible to make a simple mixture of asphalt with whatever local soil or gravel is already on the road. Whatever may be said of it, asphalt is a *relatively inexpensive* road-building material.

Even on concrete highways asphalt has its uses. On new concrete roads, it it not unusual to place a layer of asphalt down before the concrete is poured. On old concrete highways, asphalt is often a life saver. Frequently, moisture, seeping up under concrete sections, causes them to settle and break or act like see-saws. The remedy is to pump asphalt beneath the undermined section to form a firm, waterproof under-layer.

Coat of Many Uses

The same qualities that make asphalt an excellent road material make it valuable for airfields, outdoor theatres, race tracks, and the like. But not all asphalt surfaces feel the weight and roll of rubber tires. Asphalt is finding growing favor on playgrounds, tennis courts, and swimming pools. It is a vital roofing material, with 23 per cent of total production last year being diverted to that purpose. Box liners, waterproofing enamels, and other materials swell the demand for this versatile material.

Sometimes asphalt turns up in strange and unexpected places. Not many people know that it is used in the JATO (jet assisted take off) cartridges that help lift heavy planes into the air on short runways. In this service, asphalt bonds together fuel used in the cartridges. Another use to aviation during World War II was the asphalt-paper landing strips that cut down dust and sand on desert airfields.

Canal Liners

Exhaustive research and testing is expanding the use of asphalt. One relatively new and most important use is as a lining for canals. With water supplies causing concern at many points across the nation, any means to save water is important. Asphalt linings to prevent serious seepage losses from canals are saving water by the millions of gallons.

Here again, the modern world is taking a 2000-year-old tip from Nebuchadnezzar, who lined the banks of his rivers with asphalt-bonded bricks.

Seepage losses from unlined canals and laterals have always been heavy in this country, especially in the Western States, which depend to a large extent on canals for water. In one year, the U. S. Bureau of Reclamation found that 37 per cent of all canal water was lost in transit, 23 per cent of it by seepage. If the amount lost by seepage alone had been saved, an *extra million acres of land could have been irrigated in that year.*

Until asphalt linings for canals were introduced, very few miles of those vital waterways were protected against seepage. It was simply too expensive in most cases. Now, with low-cost asphalt liners available, a significant part of the nation's precious water supplies will be saved.

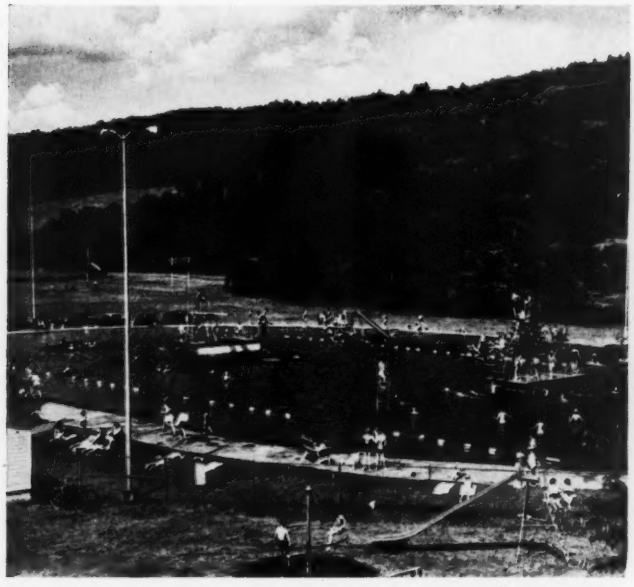
Asphalt and Daily Living

With an assist from the U. S. oil industry, which provides as much asphalt as the nation needs, our lives are affected more than we know by asphalt. It makes our travel miles fast and comfortable, in good weather or bad. It makes clean, convenient playgrounds for us and our children. It waterproofs packages and keeps our roofs from leaking. It conserves water to grow our food. And new uses are being opened all the time.

Quite a record for something that was once only a natural curiosity!

Runways at many of the nation's important airports are paved with asphalt, which has to bear the weight and resist the impact of heavy planes. World War II airmen who served in desert country may recall how asphalt paper was laid to cut down dust and sand. Below, a leading university uses asphalt to pave its tennis courts.

At play, as well as at work and on the road, asphalt makes our lives more pleasant. Swimming pool below is lined with asphalt.



The way west would have been easier and happier for our early pioneers if roads across Rockies had been paved with asphalt.

"Clear," says the operator at the main transmitter as he flips the switch to put a department dispatcher on the air. In the small picture below, a dispatcher contacts a crew, via telephone wire to the transmitter, to assign a job.

Refining With Radio

THE winch on the rigger truck groaned loudly as the big valve swung slowly from its bed and was lowered gingerly to the ground. One man leaped from the truck and removed the cable that held the valve. "Well, Slim, what d'ya reckon they'll have for us to do next?" he drawled. Slim, a big man whose nickname hadn't fit him for twenty years, shifted his "chew" to the other cheek. "I donno," he replied, throwing the winch in reverse and winding the cable back on its spool, "but you can bet that there'll be somethin'."

As if someone had heard him, a crackling sound came from the truck's radio. "3 to 305," rasped the dispatcher's voice from the rigger shack.

"There it is," Slim remarked with a wry smile as Jack jumped into the cab. Jack picked the radio receiver off the dashboard and held it to his ear. "305," answered Jack, flipping the dial.

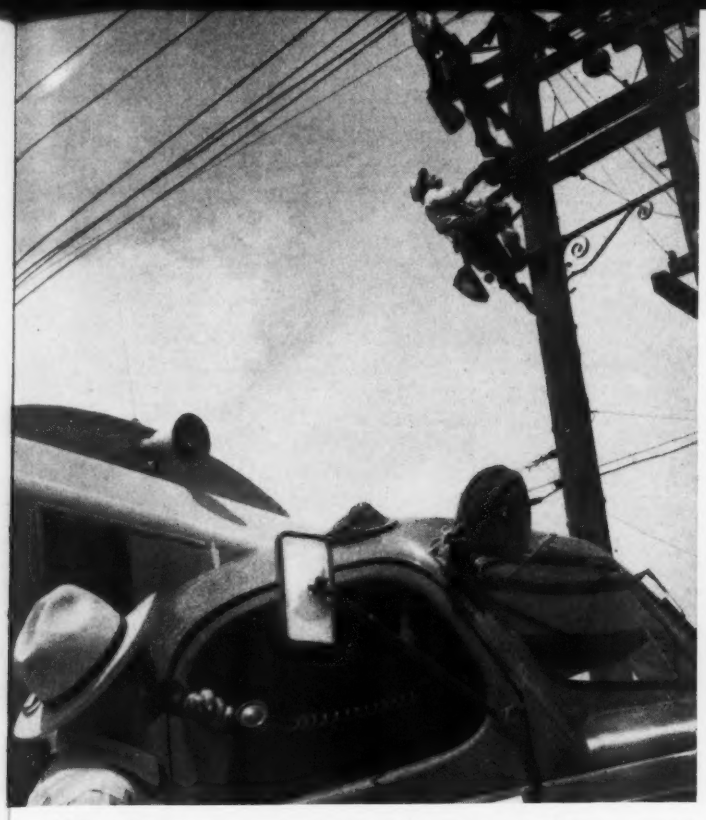
"Exchanger east side number one cat to sand blasters," squawked the radio.

"Clear," answered Jack as Slim swung the big truck onto the street and headed for the cat cracker.

Two-way radio had saved time on another rigging job at Baytown.

Time is money these days and two-way radio is a time-saver at Baytown Refinery. In the old days, a rigger crew working on the west side of the plant, after driving about two miles across the plant to the rigger shack, would find that the next job was just a short distance from the one they had just finished. Today, riggers, electricians, laborers, and other maintenance people in the refinery are directed, without loss of time, from one job to another by two-way radio.

The 60 watt FM microwave transmitter can reach out to mobile units as far away as 15 miles, or allow one unit to contact another 5 miles distant. Each of six groups, including the medical and fire departments, has a dispatcher who receives telephone calls from over the refinery telling him of jobs to be done. He keeps in contact with each piece of equipment working for his group, assigning jobs to the nearest unit. By clearing through the chief dispatcher at the transmitter by telephone, he obtains permission to go on the air to direct a unit to a new job. In turn, mobile units can radio the dispatcher,



By radio, a foreman contacts the electric shop to report and ask for a new asignment after this job is completed.

By radio, diesel locomotive engineer receives word to move an urgently needed tank car of acid into unloading position.

using his call number, to report, request supplies, or ask for a new assignment. Besides its day-to-day value in routine assignments, the radio system is especially useful in emergencies.

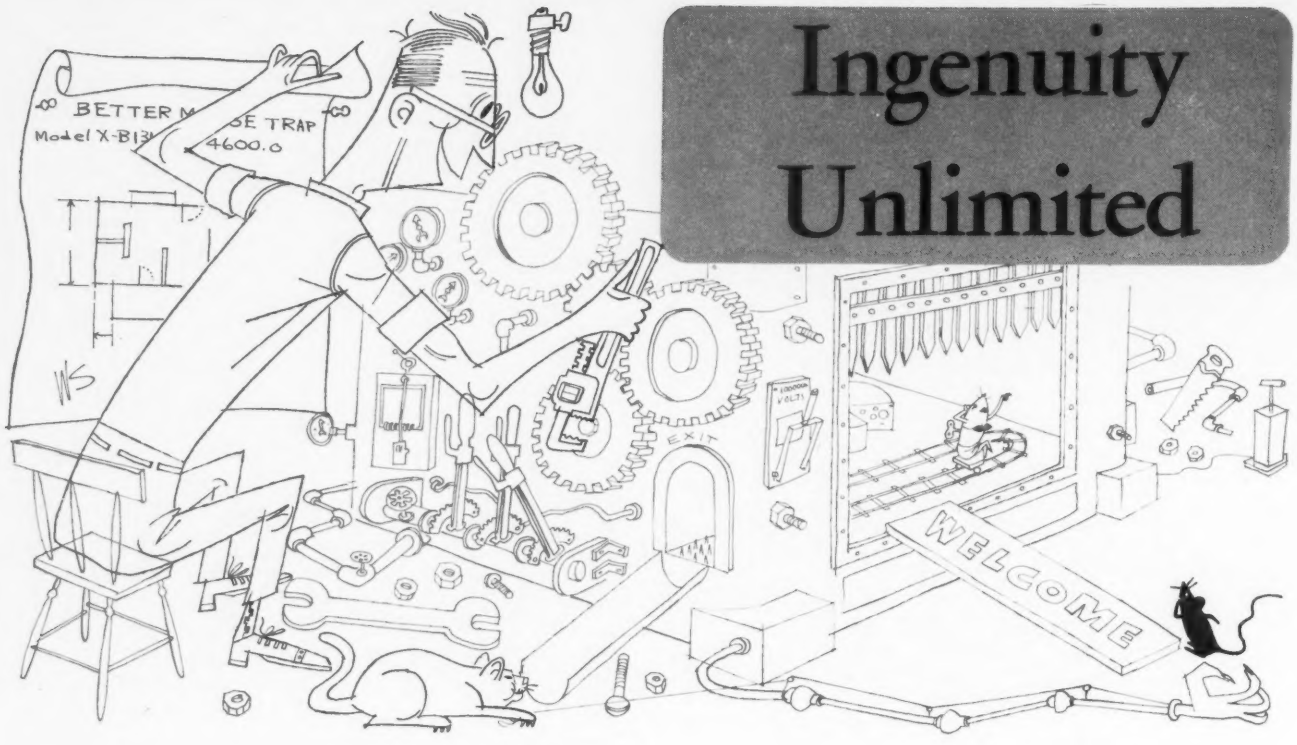
Things don't usually go wrong *slowly* in a refinery. A few minutes saved might prevent a fire or loss of control of some operating unit. With radio, the maintenance people and equipment can be quickly called to the spot. The electricians' "hotshot" truck can be rushed in to repair a pump motor; in case of fire, equipment can be quickly called into action; the visiting nurse can be notified to call on an employee who has become suddenly ill at home; or should some disaster or emergency occur in Baytown or surrounding communities, supplies and aid could be sent for.

With the help of radio, Baytown Refinery keeps its operations fluid and flexible.

By radio, the visiting nurse learns of an employee who is in need of immediate medical attention at his home nearby.

By radio, the operator of a mobile crane receives instructions to do another big job as soon as the present one is finished.

Ingenuity Unlimited



Under Humble's Coin-Your-Ideas Plan, Employees Make Valuable Suggestions and Get Cash for Their Ideas

THE natural ingenuity of the American people is a never-failing source of astonishment to the rest of the world, and sometimes to ourselves. We are a nation of tinkerers and gadgeteers—seeking always to find better ways of doing things, trying to devise quicker and easier means of getting a job done. This characteristic inventiveness of free-thinking people has been one of the prime factors in the remarkable development of our industries and our nation.

The importance of listening to the suggestions of employees for improving operations has long been recognized by the Humble Companies. Nineteen years ago, Humble set up the Coin-Your-Ideas plan to provide a just method of rewarding employees for practical suggestions. Since that time, 5,145 employee ideas have been put into practice, and the men and women who made the suggestions have received a total of $196,838 in awards. As a result of these ideas, the work of Humble employees has been made easier and operations have been improved. Every department of Humble Oil & Refining Company and Humble Pipe Line Company is able to do a better job with less work today because of the ideas contributed by employees through the Coin-Your-Ideas program.

Operation of the Coin-Your-Ideas plan is as simple as it is possible to make it. All the employee has to do is to write his suggestion on a blank form provided for the purpose and submit it to his local Coin-Your-Ideas committee. This committee, which meets once a month, is made up of supervisors and experienced employees who are fully qualified to judge whether the idea is practical. If the suggestion has merit, the local committee forwards it to a departmental committee, where it is again evaluated and passed on to the Central Committee at the main office in Houston. The Central Committee meets once each quarter, reviews the suggestions, and sets the amount of the awards. Under the present rules, it is possible for one idea to win an initial award of $200, a supplemental award of $1200 ,and a capital award of $500, for a total of $1,900.

The records of the Central Committee show that the ideas submitted by alert Humble employees cover a wide range of human ingenuity. Some of the suggestions are highly technical and involve major changes in complicated processes. For example, a first helper on a cracking unit at Baytown Refinery recently received the "jackpot" total of $1,900 for suggesting an operations change which resulted in increasing the output capacity of the unit. In the language of the refinery man, his idea made it possible to use fresh feed as quench oil for vaporizer tower bottoms when the bottoms stream is being injected to the reactor.

Successful ideas do not have to be of a technical nature, however. Another refinery employee was awarded $5 for simply suggesting that the janitors clean up an office at night instead of in the daytime to avoid disturbing the office employees. Any idea that contributes to improving operations or increasing safety is worthwhile in the eyes of the committee.

Since the refinery has the largest concentration of employees, equipment, and processes, it is not unusual that

most Coin-Your-Ideas suggestions come from the refining department. However, there are always numerous good ideas from every department throughout the companies. A roustabout gang pusher at an East Texas salt water disposal plant noticed that the steel pipe

used in spill pots had to be replaced every six to 14 months because of the corrosive action of the salt. He suggested using concrete pipe instead of steel, thereby eliminating the corrosion problem. His idea brought the maximum $200 initial award from the Coin-Your-Ideas committee. A secretary in the main office received a $100 initial award for suggesting the use of simple pieces of corrugated pasteboard to hold shorthand books upright on the typing desks. This idea eliminated the need for wood or metal notebook holders on every stenographer's desk throughout the Company. Those examples, chosen at random from the last quarter of 1950, are but two of the myriads of successful ideas in the files of the committee.

Employee interest in the Coin-Your-Ideas program has increased steadily since the plan was originated in 1931. Only 41 usable ideas were submitted during that first year, and the total amount of cash awards was $515. By way of contrast, last year 724 new ideas were accepted, and the awards totalled $39,315.

The main reason for the increased interest is that the plan has been liberalized several times since its inception. Originally, the maximum allowed for any one idea was two awards totalling $175. The program was liberalized in 1938, again in 1944, and yet again in 1949. As it now stands, an idea may win an initial award of from $5 to $200. After the idea has been in use for one year, it may win a supplemental award up to $1,200. And after two years, if the idea is of sufficient merit, it may win a capital award up to $500. There is no limit on the number of initial and supplemental awards, but only one capital award can be made in each department each year.

Since the purpose of the Coin-Your-Ideas plan is to encourage employees to make suggestions, there are no restrictions on how many ideas can be submitted. Several employees have become regular contributors of ideas, and make it a point to have at least one suggestion for consideration at each meeting of the committee. One refinery employee has received 18 separate awards for the ideas he has turned in over a period of years. Few of his suggestions have been of great importance, but his awards have ranged from $10 to $250, and he has received a total of more than a thousand dollars for his efforts. Another regular contributor has submitted 12 successful ideas, for which he has been awarded more than $1500. Frequently two employees will collaborate on developing an idea and then split the awards. That is teamwork that pays.

The Coin-Your-Ideas plan is the

door upon which opportunity knocks for both the Company and the employee. The Company sees the benefits in countless improvements in its operations; the employee in better working conditions and extra cash. Here is a good example of the type of cooperation between management and employee that is possible only where men are free to think for themselves.

THEY HAVE RETIRED

SIXTEEN employees have retired since the last issue of THE HUMBLE WAY. All except one of these employees have more than twenty years' service with the Company.

Humble Pipe Line Company—Henry H. Hageman, linerider at Albany, retired April 30 after more than 30 years' service. Mr. Hageman came to work with the Company as a warehouse-laborer in Cisco. Except for short periods spent at Breckenridge and Ranger, all of his service has been at Cisco. His recreation is maintaining a lawn around his house and fishing. In retirement, he plans to raise fruit and poultry on a small farm.

Earl C. Head, linerider in the Cisco District, retired April 30 after almost 28 years' service with the Company. He started as a laborer and later worked as an oiler, engineer, operating chief engineer, chief engineer, and line walker. His special interests include raising cattle and collecting Indian artifacts. He plans to ranch after leaving the Company.

Van L. Herrin, engineer at Mexia, retired April 29 after 24 years' service. He was employed at Corsicana as a laborer and later worked as gangman, lineworker, engineer, and pipeliner. He includes among his hobbies hunting and wood working. In retirement, he plans to spend more time in his woodwork shop.

John J. Turner, engineer at Pendell Station, retired April 16 after more than 22 years' service. Mr. Turner was employed at Pendell and has spent all of his service there except for a few days spent at Chilton. His special interest is chicken raising. He plans to supervise a farm near Valley Mills, Texas.

Paul R. Williams, chief engineer at Navasota Station, retired January 7 after almost 26 years' service.

Production Department—William Edwards, porter at East Texas Gas Plant, retired May 24 after more than 15 years' service. All of his service with the Company has been as porter for the East Texas Gas Plant. His hobbies are gardening and fishing. He will be caretaker at Humble Employees' Country Club and will spend spare time raising a garden at his home in Henderson.

Edward Foreman, roustabout at Pledger Natural Gas System, retired May 8 after 30 years' service. He was employed at West Columbia as a fireman, and he spent all of his service at West Columbia and Pledger. He is interested in sports and plans to raise a garden on retiring.

James E. Gordon, assistant district gauger in Government Wells District, retired June 4 after more than 23 years' service. Mr. Gordon joined Humble as a laborer at Webster Station. Later, he worked at Satsuma and Ingleside during his service with the Company. His special interests include baseball and dominoes.

R. C. Barbour Named Manager of Production Department

Russell C. Barbour was named manager of the Production Department on June 1, according to an announcement by President Hines H. Baker. He is active head of all production operations, reporting to C. E. Reistle, Jr., the director in charge.

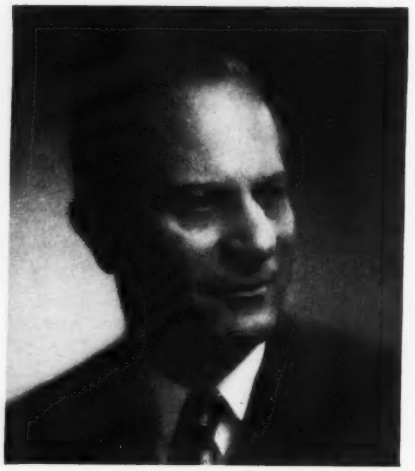
At the same time two training positions were created, to be occupied by assistant managers reporting to Mr. Barbour. These posts will be filled for the present on a rotating basis on tours of one year each.

Bowman Thomas, chief petroleum engineer, will occupy one assistant manager's post and will supervise and coordinate all staff organizations. R. R. McCarty, assistant division superintendent, Southwest Texas division, will occupy the other assistant manager's position and will supervise and coordinate drilling and producing operations.

Mr. Barbour worked for several other companies before he joined Humble in 1921 as a lease oil pumper.

Thomas

McCarty



R. C. Barbour

In 1923, he was named district superintendent of the Powell Oil Field. After eight years at this post he was appointed assistant division superintendent in East Texas during the early development in that field.

He became West Texas division superintendent in 1934, and was transferred back to East Texas as division superintendent in 1936. In 1946, he became general superintendent of the Production Department.

Baytown Refinery—Alfred Lewis, laborer, retired April 24 after almost 21 years' service. His entire service was spent in the labor and laboratory departments of the refinery. He plans to visit his father in Opelousas, Louisiana, and return to work around his house and yard.

Pearl M. Lyons, helper, retired May 1 after more than 21 years' service. Mr. Lyons began work in 1929 for the refinery in the boilermaker department as a helper. About a year later he moved to the compound department where he spent the rest of his service. Among his special interests, he includes gardening, hunting, and fishing. On retirement, he plans to raise flowers and garden at his home in Baytown.

George R. Samway, general foreman, retired May 5 after more than 31 years' service. Mr. Samway's entire career with the Company has been in the electric department of the refinery except for a few months he spent in the Production Department at Goose Creek. His hobby is working on inventions. He intends to travel some and live in Baytown.

Addy L. Sarver, pumper, retired April 21 after more than 24 years' service. Mr. Sarver started to work for the refinery as a helper in the pipe department. Later he transferred to the docks where he worked until his retirement. He and Mrs. Sarver intend to raise chickens and tend cattle on their 30-acre farm near Baytown.

Zed Taylor, laborer, retired April 23 after more than 29 years' service. All of his service with the refinery has been spent in the labor department. His special interests include church work and he plans to preach on his retirement.

Mitchell C. Smith, helper, retired March 1 after almost 21 years' service. All of his service with the refinery was spent in the pipe department and laboratory. He was in the pipe department when he retired. During his retirement he will look after his real estate interests and do some fishing.

Houston Office—John L. Counts, draftsman in civil engineering division, retired June 1 after 25 years' service. All of Mr. Counts' service with the Company has been in civil engineering. His hobbies include woodwork and carpentry. He plans to become a partner in Mrs. Counts' letter shop business.

Ethel W. Leatherberry, clerk typist in production accounting, retired March 23 after 30 years' service. All of her service with the Company has been in that work.

Employees Recently Called to Military Service

AIR FORCE

Andresen, Henry E., Jr.	Exploration-Geologic
Collins, Carl Wilbourn	Baytown Refinery
Corley, Norman Denmond	Baytown Refinery
Gregersen, Freddie Robert	Baytown Refinery
Kitchen, Jack R.	Crude Oil Accounting, Houston
Land, John Hilliard, Jr.	Stationery, Printing, Houston
Lea, Robert Matthews	Trawick Gas Construction
Roop, Clarence Alfred	Cisco Connection, Pipe Line
Scales, Harold Lee	Orange Bulk Station, Sales
Scales, Jerry Lee	Crude Oil Accounting, Houston
Watkins, Irvin Granville	Exploration-Geophysics Research
Williams, Charles Edwin, Jr.	Production Research, Houston
Wooten, Joseph David	Baytown Refinery
Wotipka, Albert John	Baytown Refinery
Wunderlich, Floyd James	Sales Accounting, Houston

ARMY

Agnello, Frank	Production Accounting, Houston
Gerbig, Willie Joe	Baytown Refinery
Lott, Henry Edgar	Gas Construction
Martin, Matthew H., III	Imogene, Production
Richter, Earl Clayton	Stationery, Printing, Houston
Rivers, Floyd C., Jr.	Sales Advertising and Publicity, Houston
Santoro, Ignations Joseph	Hall Attendants, Houston
Vavrecka, James W.	Petroleum Engineering, Houston

NAVY

Dunaway, Carel English	Production Accounting, Houston
Haynes, Grover Kay	Employee Relations, Houston
Jackson, James Bryan, Jr.	Waco Bulk Station, Sales
Love, Robert Shelton	Baytown Refinery
Mooney, Charles Speede, Jr.	Baytown Refinery
Simpson, Paul Kay	Friendswood, Production

MARINES

McIntire, William Leigh	Exploration-Geologic
Remschel, Henry Hart	Kingsville Bulk Station, Sales

Deaths

Since the last issue of THE HUMBLE WAY, 13 active employees and two annuitants have died.

Active employees who have died are: Aubrey V. Allen, 48, oiler at Lytle Station, on April 13; Allie B. Brown, 53, lease pumper-gauger at Stratton District, on May 7; Austin R. Busch, 56, relief pumper at Baytown Refinery, on April 19; Paul H. Clark, 41, senior geologist in the geologic lease and scouting division in the Houston Office, on April 18; Leslie S. Jenkins, 50, division chief dispatcher at Cisco, on May 13; Jack C. Jones, 46, general superintendent of Humble Pipe Line Company in the Houston Office, on May 22; Clayton C. Maxey, 34, roustabout at Wink District, on May 8; Joseph W. Munson, 54, local manager at Angleton Bulk Station, on May 11; Herbert A. Rachuig, 45, operating chief engineer at Tomball District, on April 26; Peter A. Stalberger, 59, chief accounting clerk at the warehouse in Houston, on May 29; Jesse F. Stoval, 58, engineer at Hearne Station, on May 29; George T. Wallace, 26, helper in geophysics, on April 10; Paul G. Weinmann, 50, gas plant pumper and gauger at Katy Gas Cycling Plant, on May 1.

Annuitants: Richard A. Denman, 70, district distribution voucher clerk for production accounting in the Houston Office before his retirement, died on April 21; Joe C. Hazlewood, 59, steam-trap repairman at Baytown Refinery before his retirement, died on May 24.

By the way . . .

The diffraction instrument and electron microscope shown here with Dr. W. O. Milligan, associate professor of chemistry at the Rice Institute, Houston, is jointly owned by the Institute and Humble. The new research instrument enlarges objects 100 times greater than the ordinary optical microscope. It enables scientists to study fundamental properties of many substances. Usefulness to Humble will come in their studies on oil producing formations in production research and on catalysts and other materials in refining research.

Tall Tower Automatically Relays Radio Messages

COMMUNICATIONS between Humble Production Department's Snyder district office and the various drilling rigs and production areas of the four-county district are now being expedited by an automatic radio-controlled relay radio station, first of its kind in Humble's operations.

The 300-foot transmitting tower (left), needed to cover the district, could not be erected at the office in Snyder because it was too near an airport. Humble's communications engineers placed the tall tower at Sharon Ridge, 10 miles away, and installed automatic radio receiving and transmitting relays.

When a message is spoken into the telephone-microphone in the Snyder district office, it goes out over a 50-watt transmitter to the receiver at Sharon Ridge. There it is picked up automatically and relayed through the 250-watt transmitter, over the 300-foot tower.

W. S. Spangler Promoted by Humble Pipe Line Company

EFFECTIVE June 11, W. S. Spangler, acting Southwest Texas division superintendent for Humble Pipe Line Company, was appointed acting General Superintendent with offices in Houston. Mr. Spangler, before going to Corpus Christi, was assistant Southern division superintendent for the Pipe Line Company.

G. W. Oliver, assistant West Texas division superintendent at Midland, assumes the post vacated by Mr. Spangler at Corpus Christi.

The HUMBLE WAY

Vol. VII No. 1

MAY-JUNE
1951

Report on Annual Stockholders' Meeting 1
New Director and Three New Vice Presidents 2
What Makes America Great?..... 4
Fishing Is No Fun..... 8
In Mountains and Marshes.....11
Asphalt Grows Up.....15
Refining With Radio 18
Ingenuity Unlimited 20
They Have Retired 22
Russell C. Barbour Named Manager.22
In the Service 23
By the way 24

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HUMBLE OIL & REFINING COMPANY

P. O. Box 2180, Houston 1, Texas

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Hines H. Baker — Rex G. Baker
David Frame — H. W. Ferguson
D. B. Harris — Morgan J. Davis
J. A. Neath — C. E. Reistle, Jr.
Richard J. Gonzalez

OFFICERS

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L. T. Barrow, *Chairman*
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D. B. Harris, *Vice President and Treasurer*
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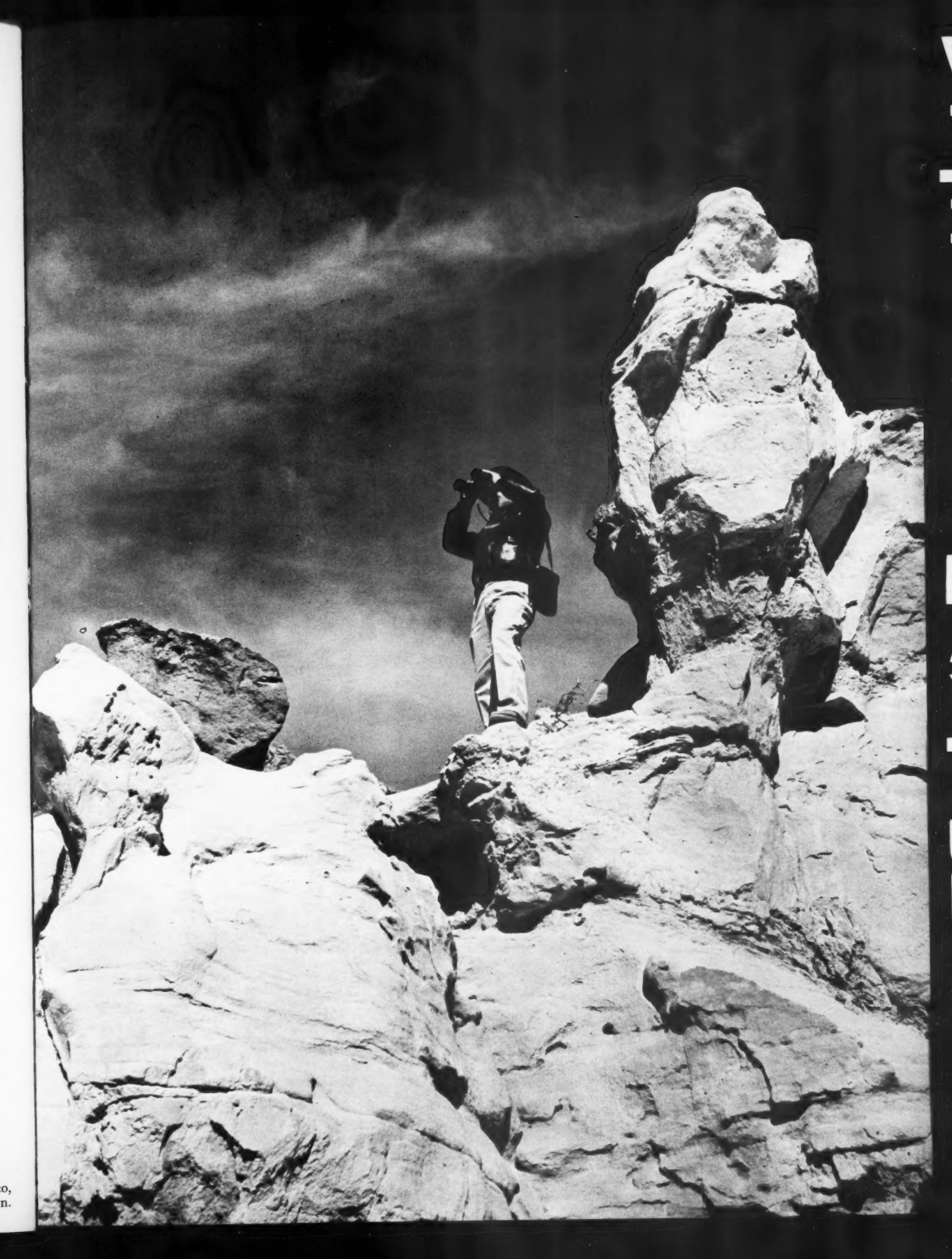
The Cover painting by E. M. Schiwetz depicts a survey crew and gravity meter crew at work in the rugged mountain country of northwestern New Mexico.

From vantage point atop large rock mass in northern New Mexico, a member of a Humble gravity meter crew scans rugged terrain.



Can't stop now!

The daily needs of the American people for oil are at an all-time high. When you add to these the needs of the defense program, you find that U. S. oil production is greater than ever before in history.

The men who search for oil did their part in supplying this record demand 10, 20, even 30 years ago.

But they can't stop now. The search for oil must be continuous so that the U. S. will have oil for you and your neighbor and for the country's needs in the years ahead. *This* year's oil discoveries may be producing oil for the vehicles, the flying machines, the industries of the year 2000!

The oil companies look so far to the future because it takes about 10 years to fully develop an average oil field. Then, if production is efficiently managed in accordance with conservation practices, the field continues to produce for another thirty or forty years, or even longer.

This foresight provided the vast quantities of oil required for World War II, and it has established the reserves the nation needs for the emergency of 1951. There is no time, now, to search for the oil we need today; it must be — it is — instantly available.

HUMBLE OIL & REFINING COMPANY